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Photoluminescence of Composite Films of Poly(N-Vinylcarbazole) with CdSe/CdS Core/Shell Quantum Dots Located Near the Layer of Silver Nanoparticles on a Dielectric Material

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Abstract

© 2015, Springer Science+Business Media New York. Photoluminescence of the composite layers of poly(N-vinylcarbazole) with CdSe/CdS core/shell quantum dots deposited on quartz glass with ion-synthesized silver nanoparticles was studied. The nanoparticles included in the quartz glass showed local surface plasmon resonance. Excitation of the composite luminescence in the spectral region of the plasmon resonance absorption resulted in an increase of the emission intensity of the polymer and quantum dots located in the near field of the silver nanoparticles. It was shown that luminescence enhancement of poly(N-vinylcarbazole) and the quantum dots occurs under excitation at different wavelengths specific to each component of the composite material.

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Keywords

composite materials, ion implantation, luminescence enhancement, photoluminescence, plasmon resonance, poly(N-vinylcarbazole), quantum dots, silver nanoparticles